REMARKS

Claims 1 and 3-24 were pending and rejected in the above-identified patent application. Claims 1, 4, 15, 17 and 22 are being amended. Reconsideration is respectfully requested.

In paragraphs 1-13, the Examiner rejected claims 1, 5-7, 10, 11, 14, 15 and 17-24 under 35 USC § 102 as unpatentable over Subramanian.

Subramanian describes a technique using a peel-out process to handle "omega-invariant" statements (i.e., statements in an iterative loop that need be performed only a small number of times of the total number of iterations of the loop). To optimize loops with omega-invariant statements, Subramanian teaches to "peel" out the iterations of the loop that require the statements (i.e., n iterations), and then to optimize the loop (by removing the statement from the loop and requiring it to iterate n fewer times than the original number of times).

The Examiner points to Figs. 5a-c of Subramanian to illustrate the external and internal access points of the claims. However, Applicant respectfully submits that Figs. 5a-c do not illustrate the internal access point as claimed. Specifically, in paragraph 1, the Examiner refers to Fig. 5a and suggests that "the kernel 503 is an internal access point added to the sequence of instructions." However, Fig. 5a of Subramanian illustrates a conventional loop, having a prologue (element 501) that defines/initiates variables and a kernel (element 503) that includes the loop to be iterated a number of times (element 505). Kernel 503 is not an access point; it is the iterative loop itself without an internal access point. See col. 11 lines 4-21.

Further, Fig. 5b does not illustrate an internal access point. Fig. 5b illustrates a loop optimized using the peel-out technique of Subramanian. In Fig. 5b, the original kernel 503 is being replaced by n peeled-out iterations of the original kernel 503 and an optimized remainder kernel 513 (which per Subramanian no longer needs to include the omega-invariant statement).

Also, Fig. 5c does not include adding an internal access point. Fig. 5c illustrates replacing the original kernel 503 with a branch process to handle the case where the number of iterations of the loop is determined dynamically. When the number of iterations of a loop is unknown, peeling out n iterations could cause problems when the loop is dynamically instructed to iterate for fewer than n iterations. Accordingly, Subramanian teaches a branch process to determine dynamically whether to use the optimized peeled-out path or the original kernel 503.

None of the teachings of Fig. 5a, 5b or 5c of Subramanian discloses adding an internal access point to handle statements unnecessarily iterated, e.g., "loop-invariant" or "omega-invariant" statements (using the terminology of Subramanian). Accordingly, Applicant respectfully submits that claims 1, 15, 17 and 23 and claims 5-7, 10, 11, 14 and 18-22 and 24 dependent therefrom are patentable over Subramanian for at least these reasons. Applicant respectfully requests that the rejection be withdrawn.

In paragraph 14-21, the Examiner rejected claims 3, 4, 8, 9, 12, 13 and 16 under 35 USC § 103 as obvious over Subramanian in view of Roediger. Roediger teaches a similar "peel-out" technique as Subramanian. More specifically, in response to recognizing instructions unnecessarily iterated in a loop, Roediger teaches "peeling," "unrolling" and combination of peeling and unrolling. Both peeling and unrolling a loop require replacing an iteration of a sequence of instructions with a peeled-out iteration. Neither process includes adding an internal access point to a sequence of instructions. The Examiner points to Fig. 4 and paragraph 43 of Roediger to show an internal recursive entry point. However, Fig. 4 and paragraph 43 describe a conventional loop with a sub-loop therein. Fig. 4 and paragraph 43 do not describe automatically adding any instructions to the loop, let alone an "internal access point" to handle an unnecessarily iterated statement and let alone more specifically an "internal recursive entry point." Accordingly, since neither Subramanian nor Roediger teaches adding an internal access point to a sequence of instructions, as claimed in independent claims 1 and 15 from which claims 3, 4, 8, 9, 12, 13 and 16 depend, Applicant respectfully submits that Subramanian in view of Roediger does not render claims 3, 4, 8, 9, 12, 13 and 16 obvious, for at least these reasons. Applicant respectfully requests that the rejection be withdrawn.

If the Examiner has any questions or needs any additional information, he is invited to contact the undersigned at 650-856-6500.

Respectfully submitted,

By _____
Marc A. Sockol
Attorney for Applicants
Reg. No. 40,823

Dated: September 19, 2005
Squire, Sanders & Dempsey L.L.P.
600 Hansen Way
Palo Alto, CA 94304-1043
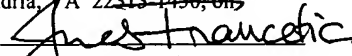Telephone (650) 856-6500
Facsimile (650) 843-8777

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